

from a hill stream at Ranipuram, a forest locality situated at an elevation of about 760 m above m.s.l. on the southeastern part of the district. All the streams originating in the hill ranges of the district empty into the west flowing rivers in the district. The hill stream wherein *Silurus wynaadensis* Day was found is spring-fed and forms the headwaters of the river Chandragiri, one of the major west flowing rivers in the district.

Silurus wynaadensis Day is distinguished from other species in the genus by having the vomerine band of teeth interrupted, the premaxillary teeth in a continuous narrow band, four mandibular barbels, anal with 58-62 rays and pectoral with 10 branched rays.

The occurrence of *Silurus wynaadensis* Day in a west flowing river in Kasaragod is an extension of its range in Kerala. Out of the three species of the genus *Silurus* Linn. found in India (Haig 1950), *Silurus wynaadensis* Day is so far known to occur in the east flowing rivers of the Western Ghats, from Wynaad in Kerala (Day, 1873, 1878) and from the Jaggar valley in Karnataka (Bhimachar and Rau, 1941) associated with the drainage systems of the

rivers Cauvery and Tungabhadra respectively. Later Rajan (1955) reported this species from the headwaters of Bhavani river which is also a tributary of Cauvery.

The present record of this species is the first in Kerala in a west flowing river.

The material examined (2 specimens 60-61.5 mm. SL, Ranipuram, 10 September, 1993) is deposited in the W.G.F.R.S. (Calicut), Zoological Survey of India.

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21. MYSTUS TENGARA (HAMILTON) (SILURIFORMES: BAGRIDAE) - AN ADDITION TO THE ICHTHYOFAUNA OF JAMMU (TAWI), INDIA.

Bagrid catfishes of the genus *Mystus* Scopoli are primary freshwater catfishes which are widely distributed in southeast Asia, the Indo-Australian islands and Africa, being found in Syria in west Asia through India, Nepal, Pakistan to Sri Lanka in the south, through Bangladesh, Burma, Thailand, Indo-China, Malaysia to East Indies, and China in the east. A few species enter the seas and estuaries. *Mystus*

Scopoli and *Rita* Bleeker are known as fossils from the Pliocene of the Siwaliks (Lydekker 1886). The African genus *Porcus* is considered the ancestor of *Mystus*, indicating the African origin of the latter genus (Jayaram 1966, 1974).

In the ichthyofauna of Jammu Province of Jammu and Kashmir State, catfishes of the genus *Mystus* are represented by two species, *M. bleekeri*

(Day) and *M. vittatus* (Bloch), along with one species of an allied genus *Aorichthys* Wu, namely, *A. seenghala* (Sykes). All these species are slow-current dwelling forms and occur in meandering portions of the Tawi (Nath 1989).

During recent investigations on the fish fauna of the River Tawi (a tributary of the Chenab drainage system), a large number of specimens of *Mystus tengara* (Hamilton) was obtained from the river at Jammu during April and May, 1995. *M. tengara* is widely distributed throughout northern India as well as Bangladesh and Pakistan (Jayaram 1981). As there is no previous record of the occurrence of this species of *Mystus* from Jammu (Tawi) to date, the present report is a new record for Jammu and Kashmir State (Nath 1992, 1994).

DISCUSSION

When we compare the ichthyofauna of Jammu Province with that of Kashmir Province as well as Ladakh region, the complete absence of Bagrid catfishes from Kashmir and Ladakh is quite significant. The nearly complete isolation of Kashmir region from Jammu Province by the Pir Panjal range mountain-

barrier has excluded many of the fish species of Kashmir region from Jammu region and vice versa. The total absence of the representatives of the families Bagridae, Schilbeidae, Heteropneustidae, Amblycipitidae, Mastacembelidae, Belonidae, Gobiidae, Belontiidae, Channidae and Chandidae of Jammu region from the Kashmir Valley suggests that the high Pir Panjal range was already established when these fishes of the Indian region migrated towards the north, but were prevented from entering Kashmir by the formidable Pir Panjal mountain range. The origin of fishes of Jammu Province is from the Indo-Gangetic region (together with a few species from Kashmir region), to which region there was migration from east to west from southeast Asia. Evidence exists that the fishes of Jammu region have probably migrated to their present habitat only in the late Pleistocene (Das 1966; Das and Nath 1971; Nath 1986).

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22. *NEOCONOCEPHALUS* SPP. A LONG HORNED GRASSHOPPER (TETTIGONIIDAE: ORTHOPTERA) FEED ON SMALL BLACK ANT

On 1st, September 1995 I was in the garden collecting insect pests of a bean vegetable. It was around 4.30 p.m., that I found a long horned grasshopper *Neoconocephalus* spp., family Tettigoniidae, descriptive and pictographic identification from Imms (1965), lifting one hind leg, on whose tarsus a black ant was biting. The reason for the biting could not be known. The hopper jerked its leg up and down due to the pain of the bite, tried to free itself from the ant, but could not. Suddenly it brought the tarsal portion of the hind leg on which the ant was biting, below its body to the mouth. The hopper caught the ant with its mandibles and ate it up completely within a moment.

M.S. Mani (1982) states that Tettigoniids are mostly diurnal forms that are usually herbivorous.

And hence the above mentioned feeding behaviour is unusual.

During my study on insect pests of bean, predatory behaviour of the the long horned grasshopper on ants has not been observed. However, the above observation indicates that under compelling circumstances, a long horned grasshopper can feed on small black ants. This behaviour needs further observation.

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23. ARE ANTS SECONDARY DISPERSERS OF FIG SEEDS IN INDIAN FORESTS?

Apart from vertebrates, which are major dispersers of seeds, several invertebrates are also known to assist in the dispersal. Beetles, earthworms, snails and ants are known to disperse seeds which may even lead to the rearrangement of the seed shadow (Beattie and Culver 1982, Roberts and Heithaus 1986). Studies have shown that fig seeds are regularly subjected to secondary dispersal by ants which harvest the lipid-containing exocarp (elaiosome) of the small fig seeds (Roberts and Heithaus 1986, Kaufmann *et al.* 1991). Despite the richness of *Ficus* species in the Indian subcontinent, information on this aspect of its seed dispersal is lacking.

While studying several aspects of fig ecology (Athreya 1993) in Karian Shola National Park, Indira Gandhi Wildlife Sanctuary, Western Ghats, I came across several indications that the secondary dispersal of *Ficus* seeds by ants may occur even in Indian forests. The vegetation of this area is dominated by the west-coast tropical evergreen forest type of Champion and Seth (1968) with *Hopea parviflora* and *Messua ferrea* being the characteristic tree species. *Ficus* trees are quite common within the National Park, especially in relatively open areas (unpubl. data).

I came across armies of ants carrying away fig seeds from fallen fruits and droppings of frugivores